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ries, investigators and writers, booksellers and book buyers.

It is evident, however, that existing agencies which are now engaged in bibliographical and index work should all be conciliated and enlisted in the work.

The Royal Society, the Smithsonian Institution, the special societies, such as the Zoölogical Society of London, the American Chemical Society, all groups of bibliographers engaged in the preparation of such works as the *Zeitschrift für Orientalische Bibliographie*, and the great individual bibliographers, like Professor Carus, should be brought in.

The sale of the work would undoubtedly cover the expense of printing and publishing, and it is not impossible that a considerable part of the expense of compiling might also thus be covered.

Considerable money subsidies would however be essential if the thing is to be done well.

The editorial work should doubtless be done without regard to geographical considerations, under the direction of specialized societies or institutions which should also be depositories of special information in regard to the bibliography to which they are devoted. It would be well, however, that in every country there should be a central office or depot where all the publications of that country should be systematically gathered.

It would seem also that some suitable plan should be devised for giving individual credit to the persons by whom the work is done, for there is an immense deal of self-sacrificing and conscientious work put into bibliography, and the pride of the bibliographer in having produced a thorough and workmanlike contribution in his chosen field is perhaps scarcely less than that of literary authorship.

G. BROWN GOODE.

U. S. NATIONAL MUSEUM.

SCIENTIFIC LITERATURE.

A Handbook of the Birds of Eastern North America. By FRANK M. CHAPMAN. New York, D. Appleton & Co. 1895. 12°, pp. 420. Library edition, heavy paper, broad margins. Pocket edition, thin paper, no margins, \$3.00.

We live in a period of unusual productivity in ornithological literature. We have technical works of scientific merit, popular works of literary merit, and local lists almost without end. But ornithologists and amateurs alike have long felt the need of a compact handbook small enough to be carried in the pocket, and full enough to afford means of ready identification. Another desideratum was that it should be written in language not too technical for the beginner. The older ornithologists, while recognizing the demand for such a book, have been too busy with special studies, and it has remained for one of the younger men to bring out.

Mr. Frank M. Chapman, the author of the present *Handbook*, has sought to fill the gap. He has written a book so free from technicalities as to be intelligible to a fourteen-year old boy, and so convenient and full of original information as to be indispensable to the working ornithologist. His plan is unique; his descriptions are from actual specimens (not compiled); they are written in plain English, so that no glossary is necessary, and are accompanied by numerous figures of heads, feet and tails as aids to identification. The description of each species is followed by paragraphs giving the geographic range (and the breeding range is commonly discriminated from the migratory and winter ranges); the time of presence at Washington, Long Id. [water birds], Sing Sing and Cambridge;* descriptions of the nest and eggs, and a brief popular ac-

*The data for these 4 stations are contributed respectively by Chas. W. Richmond, Wm. Dutcher, Dr. A. K. Fisher and William Brewster.

count of the habits. The latter is a special feature of the book. Many of the biographies are contributed by well-known authors and were written expressly for this work—a novel departure. Among the names signed to these articles are those of Mrs. Olive Thorne Miller, Miss Florence A. Merriam, William Brewster, Eugene P. Bicknell, Jonathan Dwight, Jr., Ernest E. Thompson and Bradford Torrey. But it would be unfair to imply that the contributed biographies, excellent as they are, are better than those of the author. Mr. Chapman is not only a naturalist of wide field experience and a close observer; he is in addition a true lover of birds, and his short sketches of the different species contain the essence of their life histories.

Another feature of the book is the keys to species. These keys have been prepared with great care, and, while not always dichotomous, are so complete as to enable the student to identify the females and young as well as the adult birds—a rare merit. A chromolithograph chart comprising 30 colors serves as a key to the terms used in describing plumages—an advantage not possessed by any other American Ornithology. The illustrations also are helpful. The text figures, more than 150 in number, will prove of great assistance. The frontispiece is a colored plate of the Bob-white or Quail in a bramble thicket, by Ernest E. Thompson. The other full-page plates are engraved half-tone reproductions of photographs. One shows the heads of 15 kinds of ducks and will be most useful. The remaining 16 are photographs of mounted birds in natural surroundings and serve to embellish the book. One of the best and most artistic shows a rail on his marsh (from a group in the American Museum).

Fifteen profusely illustrated pages are filled by the keys to the larger groups, and the figures alone should suffice to enable beginners to refer any bird to its proper family.

The systematic part of the book is prefaced by 40 pages of introduction, in which an effort is made to place the study of birds on a higher plane than that of the mere collector and student of technicalities. Mr. Chapman well says: "Birds, because of their beauty, the charm of their songs, and the ease with which they may be observed, are usually the forms of animal life which first attract the young naturalist's attention. . . . The uninstructed beginner usually expends his energies in making a collection, for he knows no better way of pursuing his study of birds than to kill and stuff them! Collecting specimens is a step in the scientific study of birds, but ornithology would have small claim to our consideration if its possibilities ended here."

The scope of the introduction may be seen from the chapter headings: The study of ornithology; The study of birds out of doors (including bird calendars for the vicinity of New York); Collecting birds, their nests and eggs; Plan of the work (including a bird diagram, feather patterns, and so on).

It is hard to find anything worthy of serious criticism in this excellent and timely book. The use of English inches instead of millimeters is a blemish in a work of scientific value, and is less excusable since the persons who use it will be students and graduates of our schools, who are familiar with the system. We trust that in the next edition the author will not only substitute millimeters for inches and fractions, and make all the keys dichotomous, but that he will enlarge the scope of the work so as to take in the great West as well as the East—giving us a 'Handbook of the birds of America north of Mexico.'

The plan and originality of Chapman's Handbook, its copious illustrations, bountiful keys, succinct accounts of habits, convenient size and low price insure it wide popularity; while as a handbook of the

birds of eastern America it is bound to supersede all other works. It is a boon to the amateur, a convenience to the professional, and will prove a help and incentive to the study of birds. Such books are now among the greatest needs in all departments of natural history.

C. HART MERRIAM.

National Geographic Monographs, prepared under the auspices of the National Geographic Society. No. 1, Physiographic Processes; No. 2, Physiographic Features. By J. W. POWELL, late director of the United States Geological Survey. New York, American Book Company, 1895. Twenty cents a number. \$1.50 a year (ten numbers).

The first two numbers of the geographic monographs, announced in SCIENCE No. 10, have lately been issued under the above titles. The series is to appear monthly during the school year, the special object of the publication being "to supply to teachers and students of geography fresh and interesting material with which to supplement the regular text-book."

A series of essays like this deserves a warm welcome from those who are interested in raising the standard of geographical teaching, and the two numbers now issued are of particular importance in several ways. They affirm, with an emphasis not hitherto given in this country, that the proper foundation of geographical study is an understanding of physiographical processes; they mark the entrance of various members of our National scientific bureaus into the work of publishing the best selections from their knowledge in essentially elementary form, with the intention of aiding teachers and scholars in our schools; they represent not simply the temporary effort of an individual, but the continued efforts of a body of experts to introduce subjects of better quality and treatment into ordinary geographical study. Such an undertaking, if success-

fully maintained, cannot fail to impress itself strongly all through our educational system, for, instead of appalling the reader at the outset with a large treatise of heavy cost, it continually tempts him to go further and further by the successive appearance of attractive and interesting but inexpensive pamphlets, month after month and year after year.

The publishers present the monographs in good form, well illustrated, and certainly at a very moderate price.

It is particularly interesting to receive in these two numbers the results of Major Powell's long consideration of physiographic questions. For some years his attention has been so largely given to administrative work in connection with the National Geological Survey that we have had comparatively little from his pen; but now we learn the general views that have been gradually forming during his long experience of the many aspects of geography and geology; here we find tersely presented his matured opinions on the essential elementary conceptions concerning deformation and denudation, about which our teachers are as a body so indifferent, so skeptical or so timid. Mountains are not described as the result of chaotic uplifts, but as the unconsumed remnants of broadly uplifted and deeply eroded masses. The product of long-continued denudation is not illustrated by a canyon or a valley, as so many of the text-books in current use imply, but by a broad surface of faint relief, close to baselevel. The lesson of our West that volcanic action is not so dependent on neighborhood to the sea as has been generally supposed is given perhaps too much importance; for no association of vulcanism with the ocean is mentioned. Among geologists, these announcements may not be regarded as novel, nor are they so presented; but it is certainly novel to have them addressed to teachers of geography, and to have them emphasized